

SCENARIO PLANNING TOOL FOR FOREST WATER YIELD IN NORTH FLORIDA

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Meeting regional water demand while protecting flows and levels in natural aquatic ecosystems requires attention to both direct and indirect water uses. The emphasis in north Florida has been appropriately directed at direct consumption, but changes in water availability due to changing land cover and land use are also important to consider. Recent work suggests that water yields can be increased by adopting conservation forestry practices, such as tree thinning and regular application of prescribed fire.

While conservation forestry has many goals, including habitat and biodiversity improvement, the water yield impacts are now more effectively quantifiable using information on site properties. The water yield benefits are potentially significant. For example, restoration of a typical intensive silviculture stand to low-density longleaf pine savanna can increase water yield by nearly 200,000 gallons per acre per year. At present, no scenario planning tool exists that embeds water yield predictions within a geographic information system that allows easy evaluation of parcel management options. The goal of this project is to create such a tool for use by land conservation organizations in Florida.

Applying results from recent predictive modeling, this ArcGIS-based tool will integrate information about site aridity (the ratio of potential evapotranspiration and precipitation, obtained from existing climate observation networks), forest structure (leaf area index, measured in the field and estimated from satellite imagery), and hydrogeologic setting (water table depth approximated by whether the aquifer is confined or unconfined, which can be obtained from hydrogeologic maps) to yield robust predictions of water yield change resulting from management options. The user can select management scenarios driving the temporal dynamics of leaf area index for individual parcels or groups of parcels, allowing informed decision-making regarding rotation lengths, thinning schedules, and other aspects of forest management.

PRESENTER BIO: Dr. Glodzik is a Postdoctoral Associate at University of Florida in the School of Forest, Fisheries, and Geomatics Sciences. She specializes in wetland ecology, quantitative ecology, and geospatial analysis. Her PhD research focused on saltwater intrusion and hydrologic change impacts to salt marsh and coastal forest along Florida's Gulf Coast.